

Perspectives on International Climate Policy, the IPCC, and US Climate Policy

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Climate Change: Science, Impacts,
Technologies and Policy Seminar

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IPCC Informs International and Domestic Climate Policy

Table SPM.5: Characteristics of post-TAR stabilization scenarios [Table TS 2, 3.10]^{a)}

Category	Radiative forcing (W/m ²)	CO ₂ concentration ^{c)} (ppm)	CO ₂ concentration ^{c)} (ppm)	Global mean temperature change (°C)	Stabilization period for CO ₂ emissions ^{d)}	Change in global CO ₂ emissions in 2050 (% of 2000 emissions) ^{d)}	No. of assessed scenarios
I	2.5-3.0	350-400	440-490	1.1-1.8	2015-2030	-85 to -50	6
II	3.0-3.5	400-440	490-540	1.8-2.4	2015-2030	-60 to -30	18
III	3.5-4.0	440-485	530-580	2.4-3.1	2015-2030	-30 to +5	21
IV	4.0-5.0	485-570	590-680	3.1-4.0	2060	+10 to +60	118
V	5.0-6.0	570-660	710-800	4.0-4.9	2060-2080	+25 to +85	9
VI	6.0-7.5	660-790	855-1130	4.9-6.1	2060-2090	+90 to +140	5
Total							177

Global CO₂ reductions in 2050 of 50-85% consistent with warming of 2 to 2.4 degrees Celsius

IPCC (2007)



Group of 8 (2009)



U.S. Goal (2009-2010)



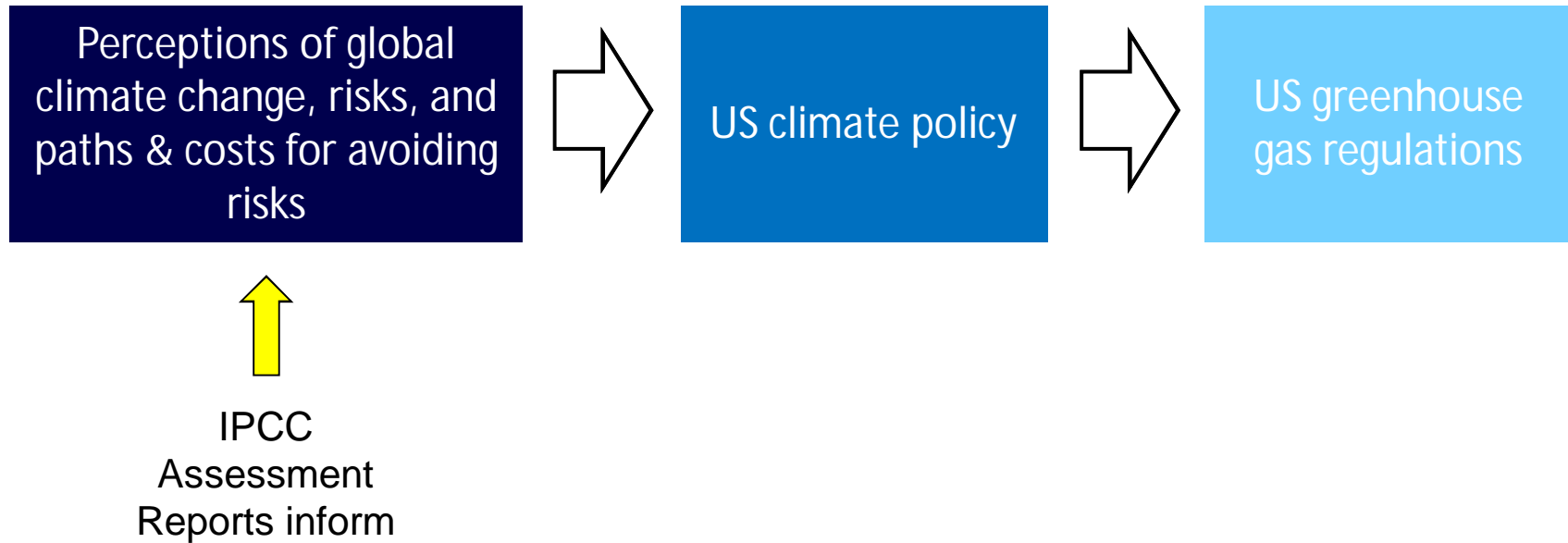
U.S. Regulations (2013-)

"G8 leaders agreed to reduce their emissions 80% or more by 2050 as its share of a global goal to lower emissions 50% by 2050, acknowledging the broad scientific view that warming should be limited to no more than two degrees Celsius."

Reduce emissions by 83% by 2050 relative to 2005 (U.S. Copenhagen Accord submission; U.S. Legislative proposals)

Climate Action Plan: pursue executive actions to reduce carbon pollution, e.g., "...establish carbon pollution standards for both new and existing power plants."

Perceptions Drive Climate Policy



Country Emissions Reduction Pledges Going into Paris (COP-21)

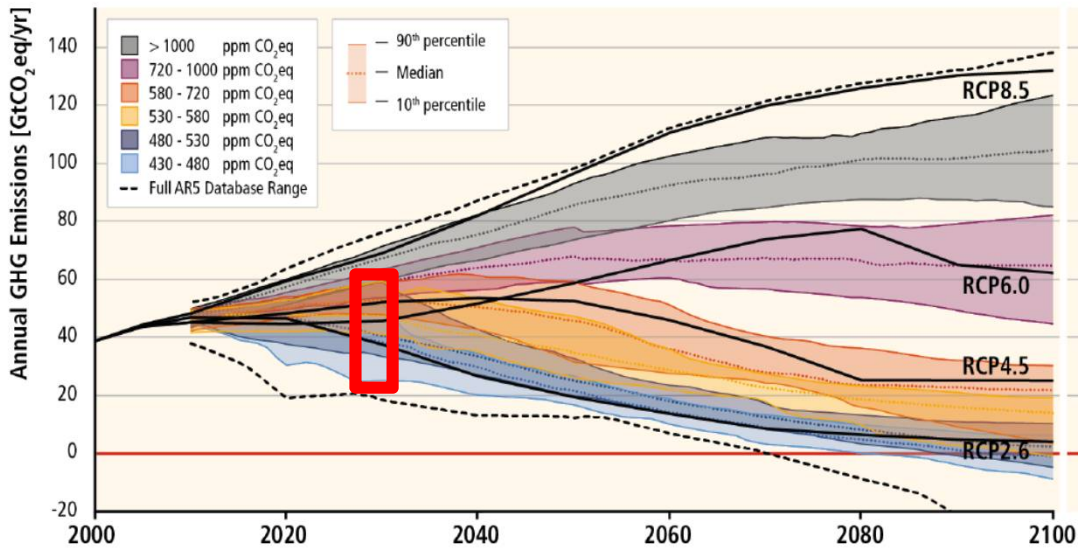
Intended Nationally Determined Contribution (INDC) and China pledges (to date)

Country/Region	Pledge	Target year
USA	Economy-wide Kyoto GHGs 26-28% below 2005	2025
EU	Economy-wide Kyoto GHGs 40% below 1990	2030
China	Peak in total CO ₂	2030
Mexico	Economy-wide Kyoto GHGs & Black Carbon 25% below BAU	2030
Russia	Economy-wide Kyoto GHGs 25-30% below 1990	2030
Gabon	CO ₂ +CH ₄ +N ₂ O 50% below BAU	2025
Norway	Economy-wide Kyoto GHGs 40% below 1990	2030
Switzerland	Economy-wide Kyoto GHGs 50% below 1990	2030

Discussion about comparability, ambition, compatibility, participation, verification, compensation, etc.

Global Ambition? Pledges and Long-Run Climate Goals.

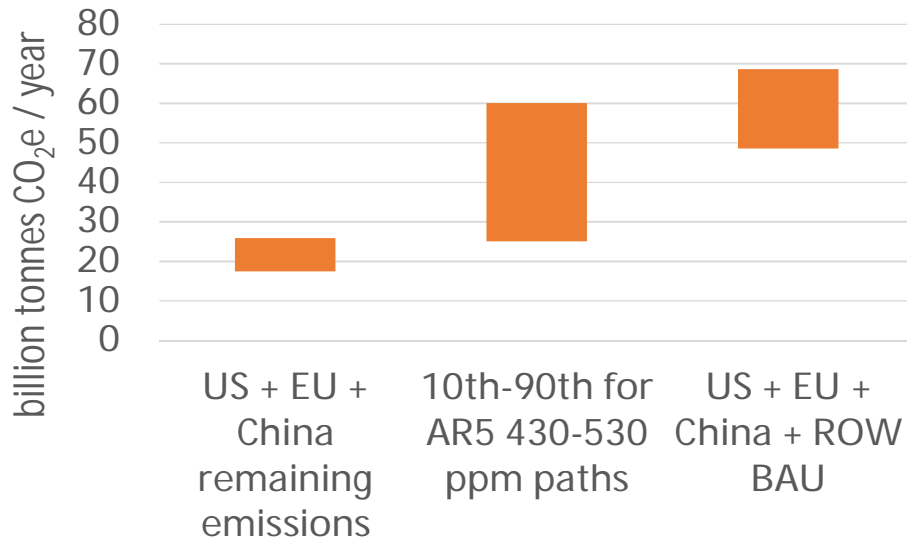
GHG Emission Pathways 2000-2100: All AR5 Scenarios



AR5 430-530 ppm CO₂e pathways consistent with staying below 2 degrees C with 40% or better likelihood.

2025-2030 10th – 90th percentile window ~25-60 GtCO₂e.

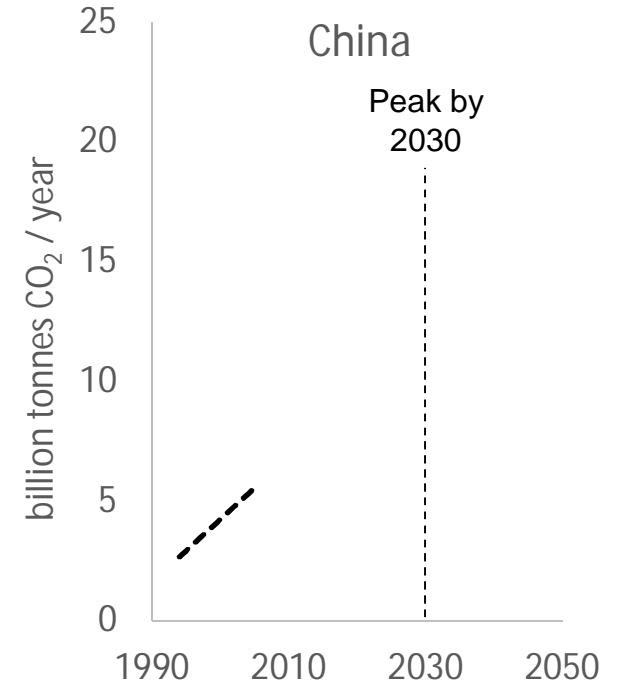
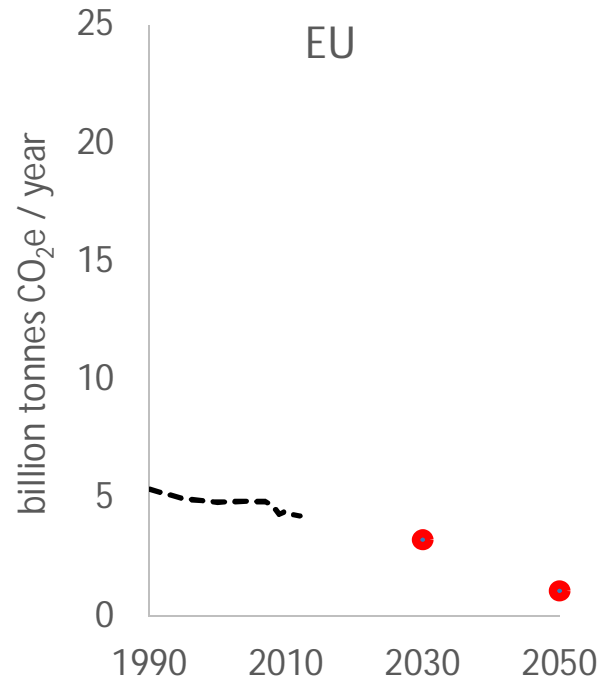
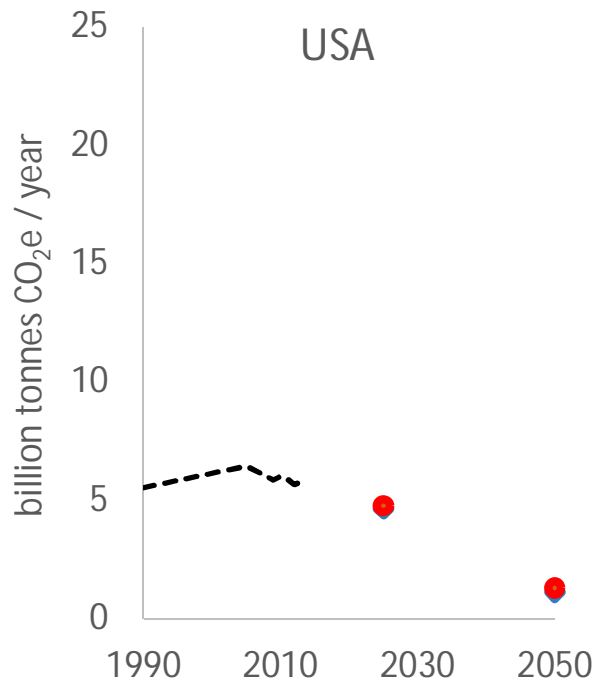
2025-2030



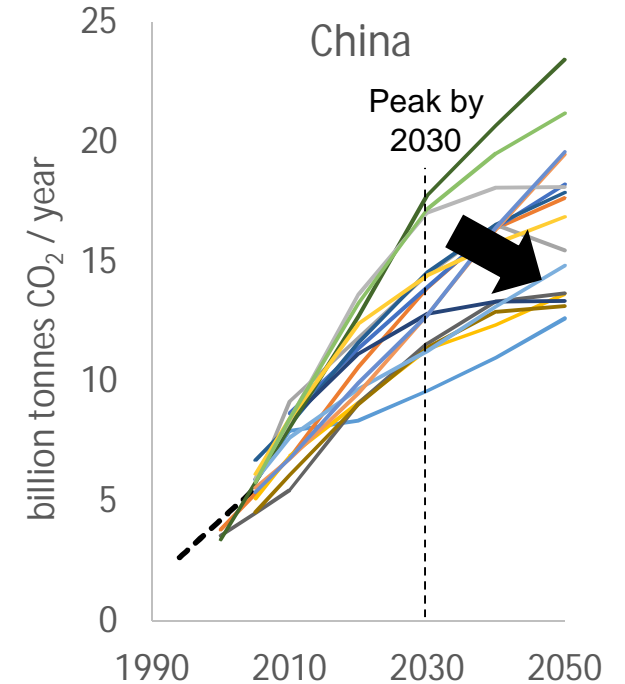
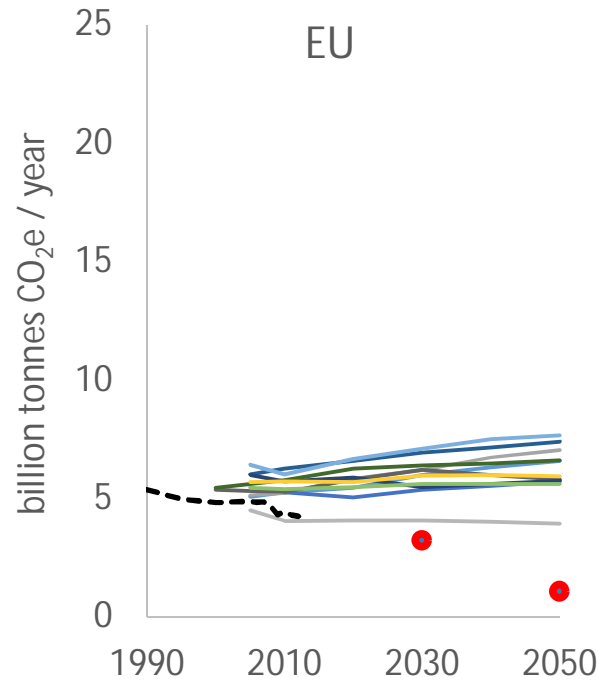
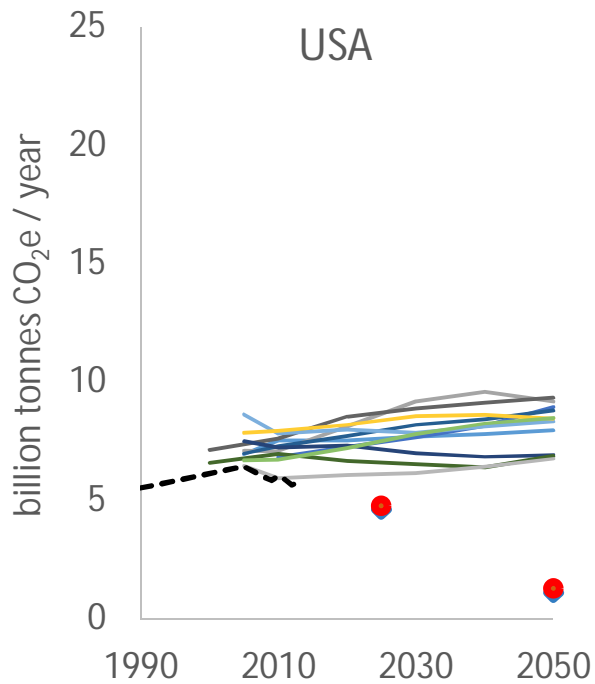
Without ROW reductions we are either on a different path or need rapid global post-2030 reductions (ROW & US+EU+China)

* China & ROW BAU estimated with EMF-27 scenarios

Country Ambition? Pledges and Baselines.

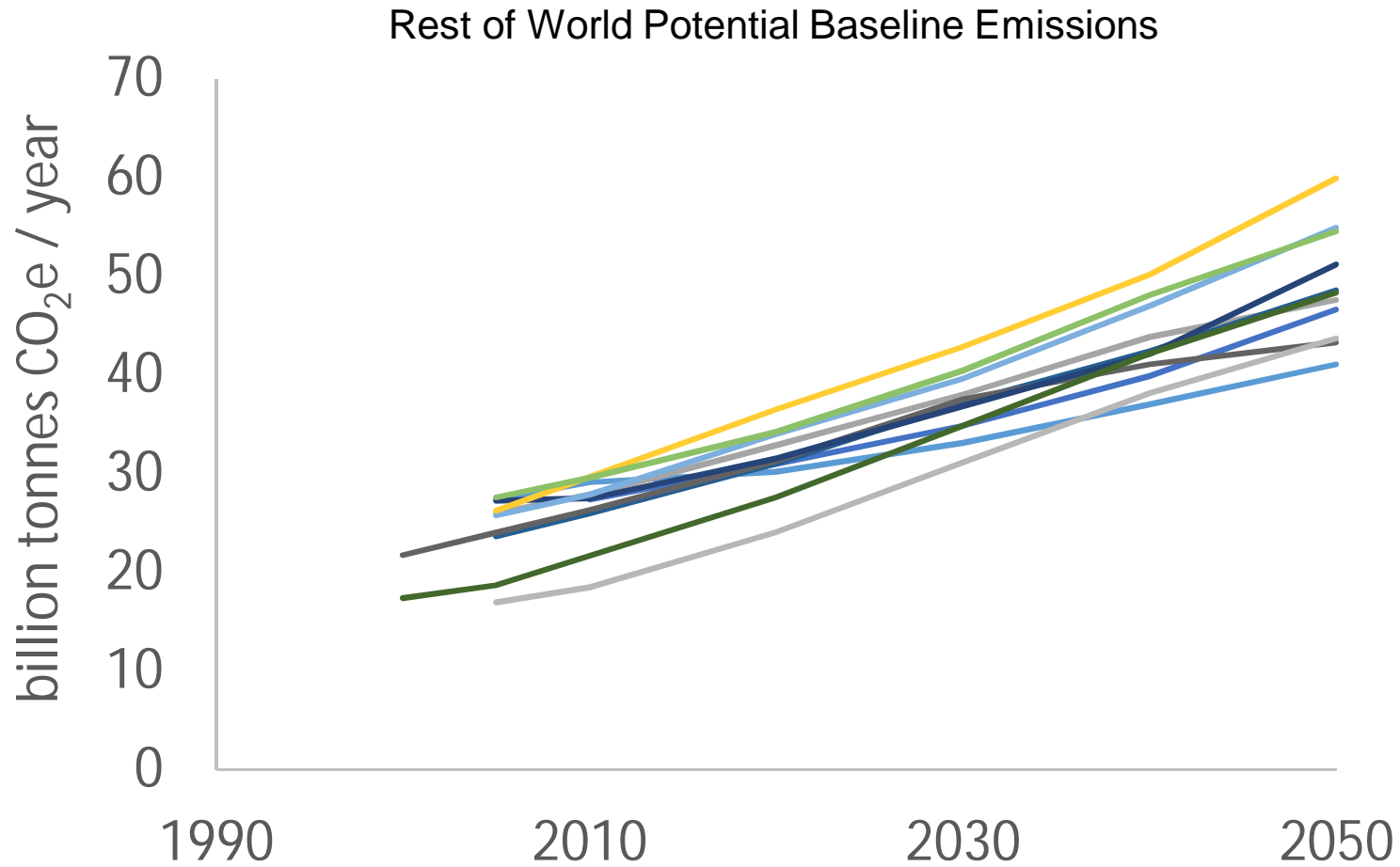


Country Ambition? Pledges and Baselines.



* Baselines from EMF-27 Study scenarios

The Rest of the World's Emissions Critical



* Baselines from EMF-27 Study scenarios

Pledge Implementation a Critical Post-Paris Issue

- Domestic and international implementation issues
- Coverage
 - Economic sectors
 - Greenhouse gases
 - Other radiative forcing substances
- Mitigation technologies – eligibility, R&D
- Domestic policy instruments – regulations, market mechanisms (cap-and-trade, tax, offsets), coordination (across sectors/activities)
- International policy instruments – market mechanisms (links, offsets), coordination (across countries), trade policy
- Long-run policy – beyond 2025/2030

US Greenhouse Gas Emissions Reduction Policy

- Federal policy primarily regulatory

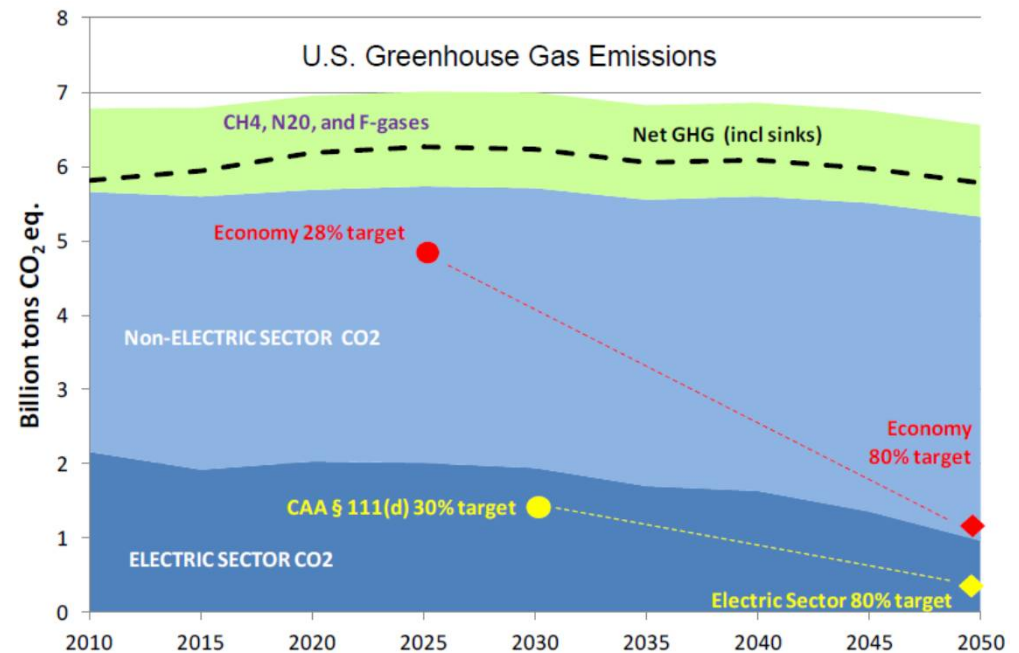
- Clean Power Plan
- PSD (Prevention of Significant Deterioration)
- Biogenic Carbon Accounting
- Methane regulations

- Renewable Fuels Standard
- Vehicle standards (CAFE)
- Appliance and equipment efficiency regulations
- Social Cost of Carbon

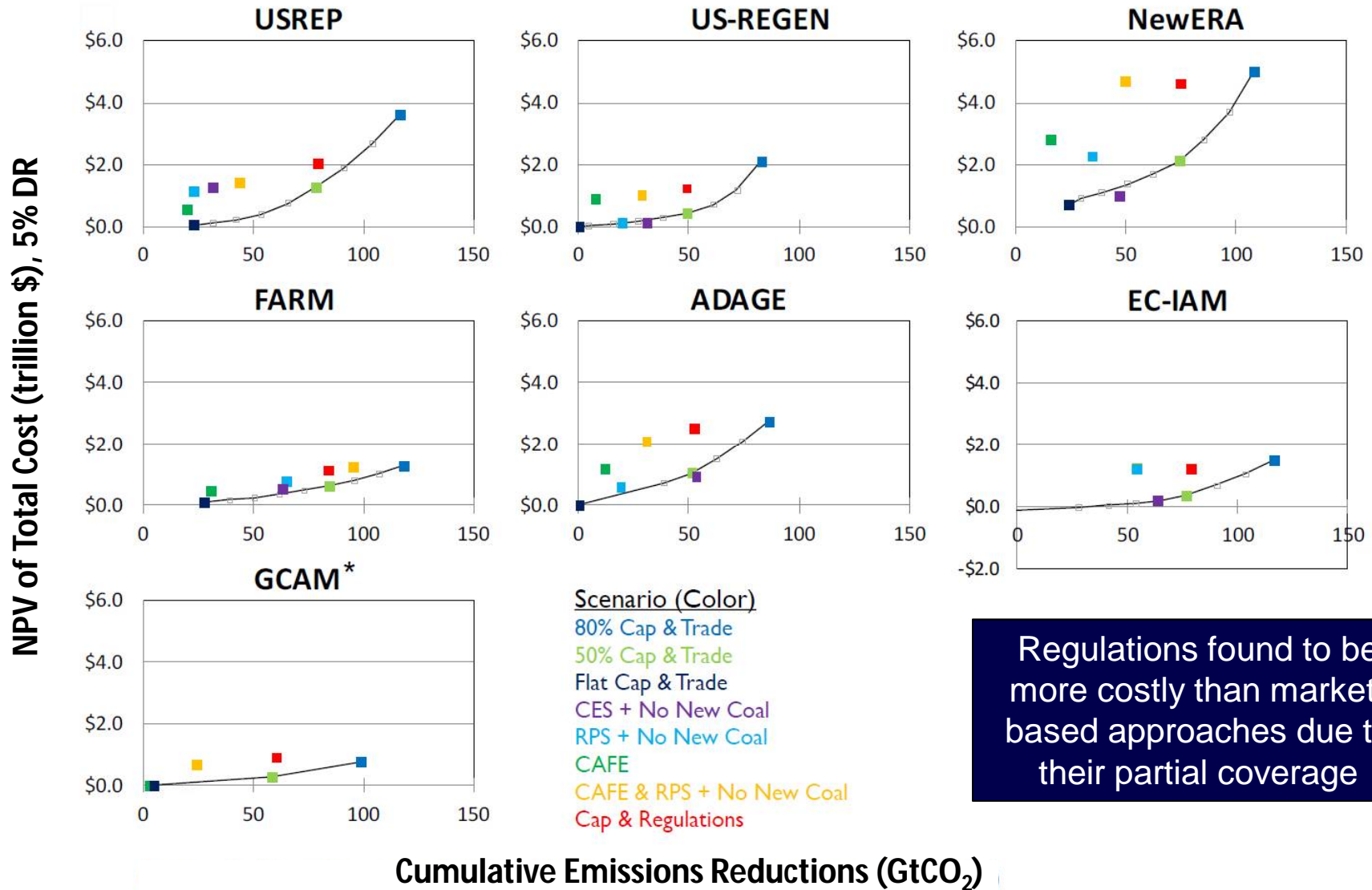
- Non-regulatory policy? e.g.,

- NEPA compliance
- Land policy

- State policy – e.g., California AB32, Northeast RGGI, renewable fuels & portfolio standards, externalities policies

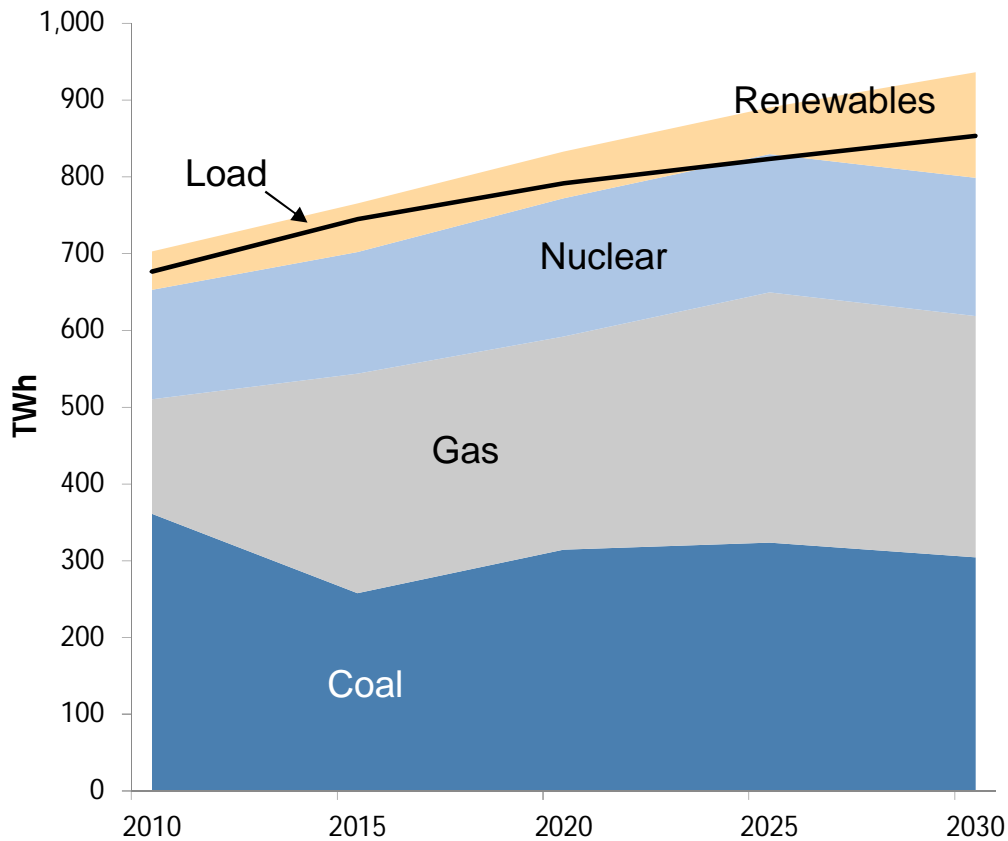


Cost-Effectiveness – Cost Comparisons of Different U.S. Climate Policy Architectures

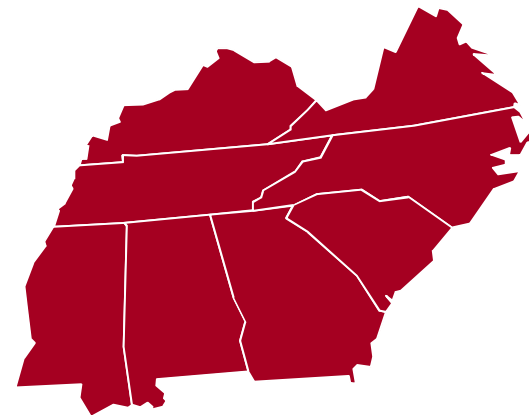


Southern US Power System in the Future?

Potential Regional Reference Future Power Generation



How might the system transform?
Policies?
Technologies?
Implications (emissions, investments, costs, benefits)?

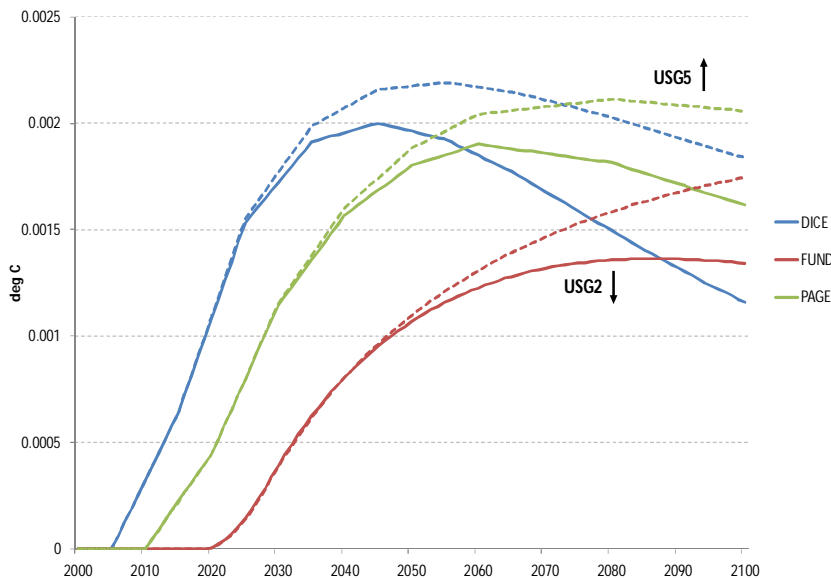


Mitigation Benefits State of the Art – Social Cost of Carbon

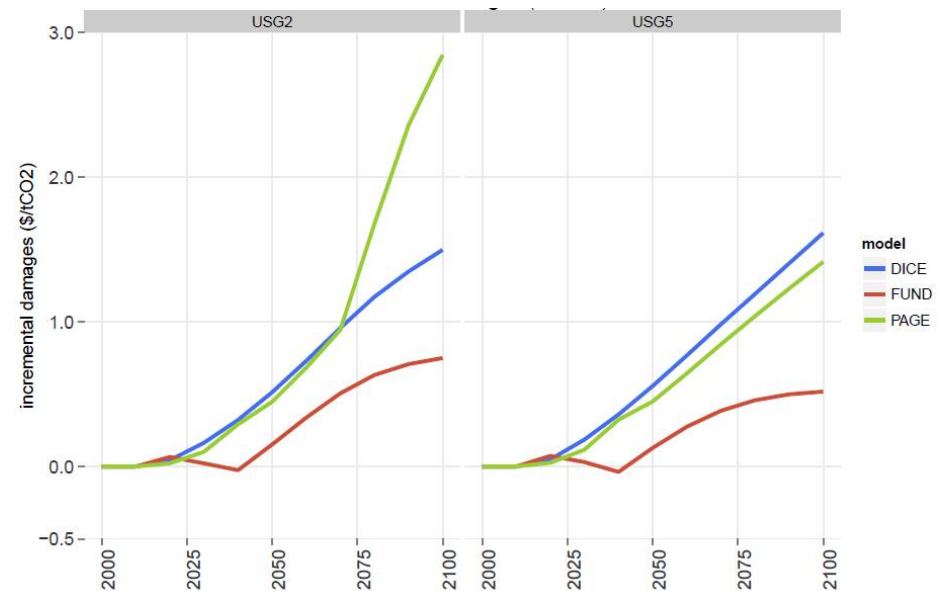
- A detailed technical assessment found fundamental challenges and issues
 - Significant differences in underlying modeling and responses – poorly understood
 - Inconsistencies in modeling and additional uncertainties to consider
 - Inter-model relationships
 - Sensitive results
 - Robustness potentially an issue

Reference: *Understanding the Social Cost of Carbon: A Technical Assessment*,
<http://epri.co/3002004657>.

Projected Incremental Temperatures



Projected Incremental Global Damages



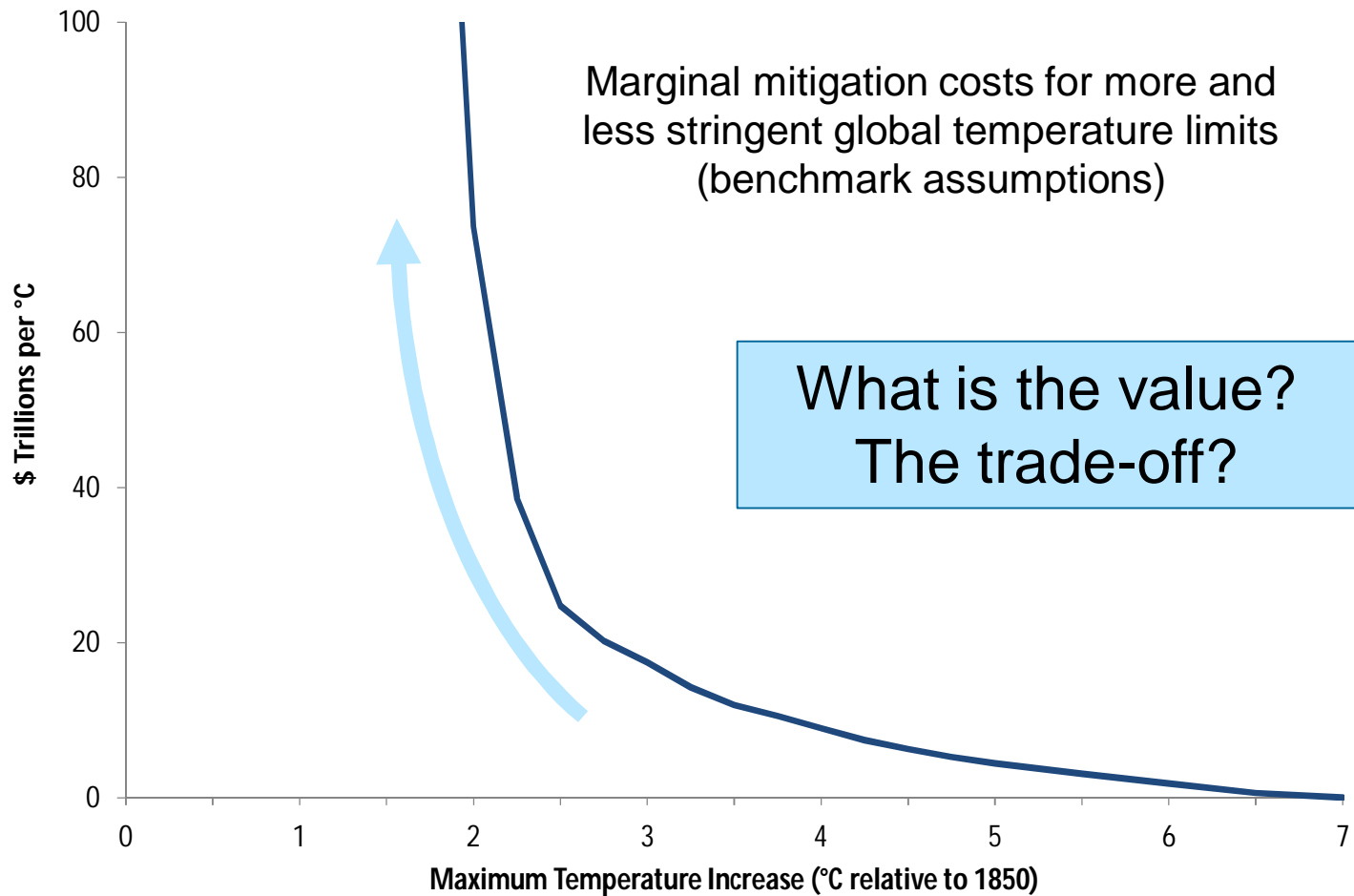
Looking Forward

- COP-21 (Paris, Nov/Dec 2015) – country pledges

- Beyond Paris – pledge implementation
 - But also, discussion of long-run climate objectives

- Some wildcards
 - U.S. Presidency
 - Scientific understanding
 - Especially regarding potential risks, costs & benefits, and risk management

Need a Better Economic Foundation for Thinking About Long-Run Goals



Source: *Blanford et al. (forthcoming)*



Thank You!

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